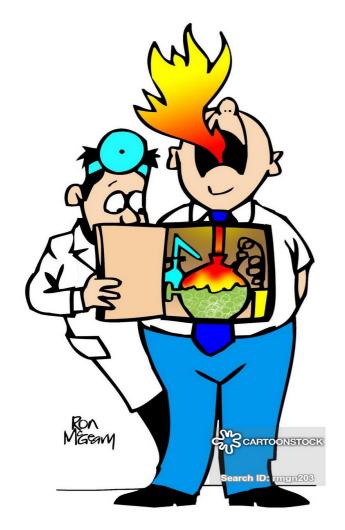
Armed Forces College of Medicine

AFCM

Have
A Good
Day!

Diseases of Esophagus

Dr. Riham Abu-Zeid
Prof. of Pathology

INTENDED LEARNING OBJECTIVES (ILO)

By the end of this lecture you will be able to:

- Classify causes of esophageal ulcers and dysphagia
- Explain pathogenesis & complications of achalasia & esophageal diverticula
- Describe pathology & complications of reflux esophagitis & Barrett's esophagus
- Classify tumors of the esophagus
- Describe the pathology and complications of esophageal carcinoma
- Correlate pathologic features of esophageal diseases with their clinical pictures and complications

Lecture Plan

1. Part 1 (15 min):Esophageal obstruction & Achalasia
2. Part 2 (20mins) :Esophagitis-GERD-Barret’s esophagus
3. Part 3 (10): Tumours of esophagus
4. Lecture Quiz (5 min)

Symptoms of Esophageal disorders

- **Dysphagia** (difficulty in swallowing)

https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSIVXD9aBzRIR5-Xpmbl3Ch36HZnqOHhoNF5GANnm3aKs23FdImAg

- **Heartburn** (retrosternal burning pai

http://functionalhealthminute.com/wp-content/uploads/2014/07/heartburn-and-hypochlorh

- **Hematemesis (**vomiting of blood)

maxresdefault.jpg

Esophageal Ulcers

:Causes

:Traumatic -1

A- Physical trauma: following .instrumentation

.B- Chemical trauma: corrosive injury

:Inflammatory -2

A- Peptic ulcer: at lower part, with reflux .esophagitis

B- Infection: e.g. Tuberculous ulcers- Candida

.**Malignant ulcer -3**

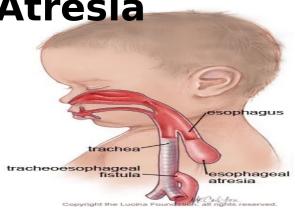
Effects of ulcers:

1- Hematemesis

2- Fibrous stricture

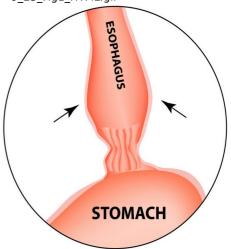
https://www.sciencesource.com/Doc/TR1_WATERMARKED/1/6/5/c/SS2139921.jpg?d63641230700

Esophageal obstruction (Dyspahagia)

Atresia

https://www.creativehealthyfamily.com/wp-content/uploads/2014/02/EA-TEF.jpg

Extra- mural

https://media.springernature.com/original/springer-static/image/chp%3A10.1007%2F978-1-4614-4292-9_25/MediaObjects/978-1-4614-4292-9_25_Fig1_HTML.gif

Post inflammatory stricture

https://image.slidesharecdn.com/esophagealstricture-180116070121/95/esophageal-stricture-3-638.jpg?cb=1516086111

Malignant neoplasm.

https://img.medscape.com/news/2014/dt_140703_esophagus_cancer_800x600.jpg

https://cdn5.vectorstock.com/i/1000x1000/13/34/achalasia-of-the-esophagus-expansion-of-esophagus-vector-20421334.jpg

Esophageal obstruction

Causes of Dysphagia

A-Organic

- Mural
- Luminal
- Extra-mural

B-Functional

Achalasia

A-Organic

***-Mural stricture*:**

- **Congenital:** Atresia.
- **Acquired** : 1- Post inflammatory stricture.
  2- Malignant neoplasm.
- ***Luminal*** **:** Tumour, Foreign body
- ***Extra- mural:***

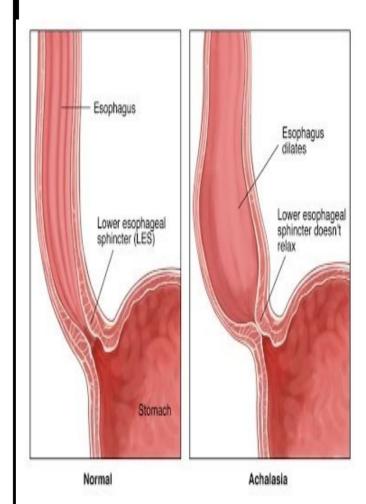
https://i.pinimg.com/236x/c2/86/75/c28675a79c7d8840deecb23ae853bc79--swallow-sleep.jpg

B-Functional obstruction Achalasia

Def:

- Functional obstruction of esophagus due to
- Inadequate relaxation of lower esophageal sphincter
- Leading to -->Dysphagia
- Consequent dilation of proximal esophagus.

Pathogenesis:

- Loss of ganglion cells in the myenteric plexus (identified microscopically)
- **Primary** : unknown cause
- **Secondary** : - Infection by Trypanosoma cruzi

https://i.ytimg.com/vi/Ck5Xhre-UZU/hqdefault.jpg

Achalasia

C/P:

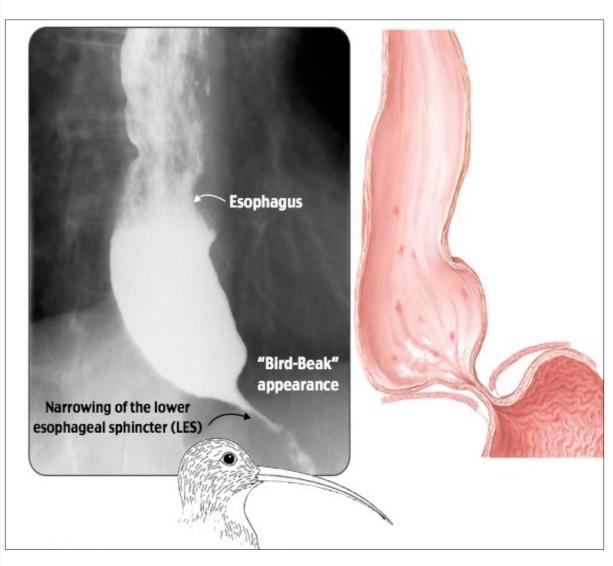
Regurgitation of undigested food -Chest pain –Weight loss

Investigation :

Bird beak sign in barium meal

Complications:

- Progressive dysphagia
- Inflammation and ulceration

  (due to stasis of food)
- **Squamous cell carcinoma**

https://www.kediamd.com/wp-content/uploads/2017/11/Achalasia.png

Esophageal Diverticula

:Def

Saccular out-pouching of the .esophageal wall

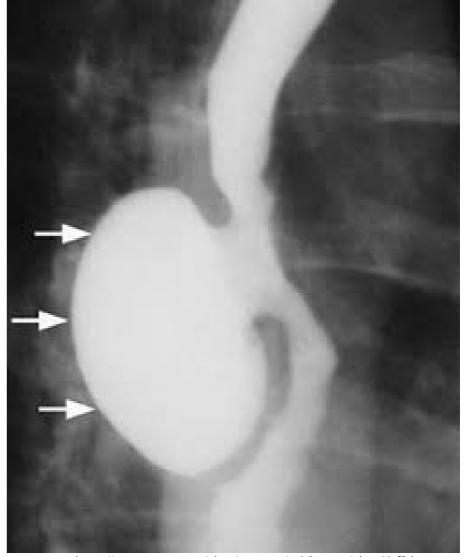
:Etiology

;Weakness of muscular wall (congenital or acquired)

:associated with

Pulsion: Increased intra- **-1** .luminal pressure e.g. achalasia

Or

Traction: from outside on **-2** weak area by fibrous adhesions

https://www.nature.com/gimo/contents/pt1/images/gimo41-f3.jpg

Esophagitis

:Def

.Inflammation of the esophagus

:Etiology

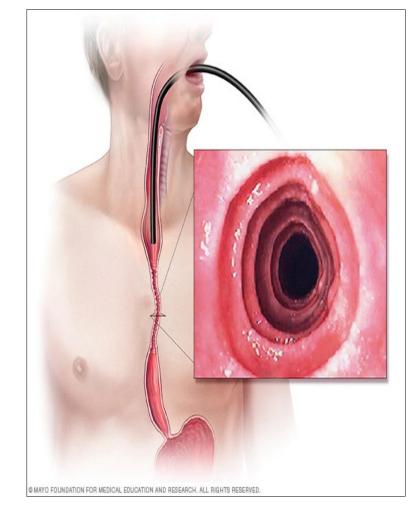
.A- Reflux esophagitis

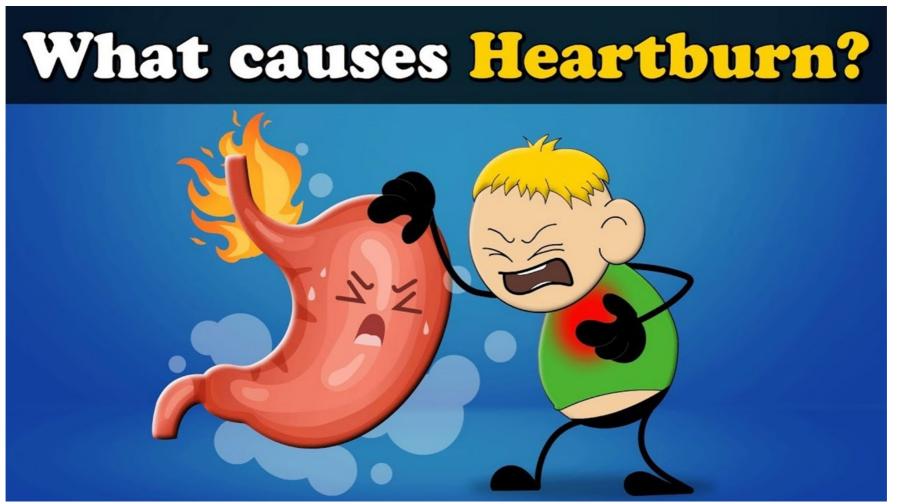
:B- Others(Non reflux causes)

Infection: Viral, Fungal(e.g. monilial)-1

Corrosive injury-2

Metabolic: e.g. uremic -3

Radiation -4

https://www.mayoclinic.org/-/media/kcms/gbs/patient-consumer/images/2013/08/26/10/47/ds01154_im04155_mcdc7_eosinophilic_esophagitisthu_jpg.jpg

Esophagitis

What causes Heartburn?

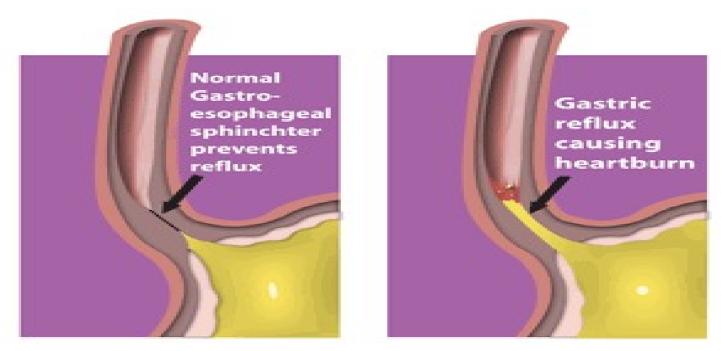
https://i.ytimg.com/vi/zIyfZdGeI-s/maxresdefault.jpg

Reflux esophagitis
Gastroesophageal Reflux Disease(GERD)

Def:

Esophageal inflammation due to repeated reflux of gastric contents into lower esophagus

https://www.supplementnews.org/components/com_openwiki/lib/exe/fetch.php?w=&h=&cache=cache&media=acid-reflux-small.gif

Reflux esophagitis
Gastroesophageal Reflux Disease(GERD)

Pathogenesis :

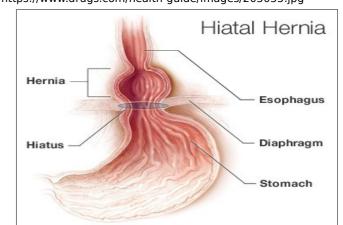
Reflux of gastric contents due to:

.Incomptent lower esophageal sphincter -1

2- Hiatus hernia (protrusion of part of stomach through

diaphragmatic orifice)

3- Increased intra abdominal pressure, obesity,

https://www.drugs.com/health-guide/images/205055.jpg

https://img.webmd.com/dtmcms/live/webmd/consumer_assets/site_images/article_thumbnails/reference_guide/medical_reference/

Reflux esophagitis
Gastroesophageal Reflux Disease(GERD)

C/P: burning epigastric pain more after meals

Gross: (endoscopy)

- Redness
- Superficial erosion of lower esophageal mucosa.

https://upload.wikimedia.org/wikipedia/commons/thumb/1/16/Peptic_stricture.png/220px-Peptic_stricture.png

Reflux esophagitis
Gastroesophageal Reflux Disease(GERD)

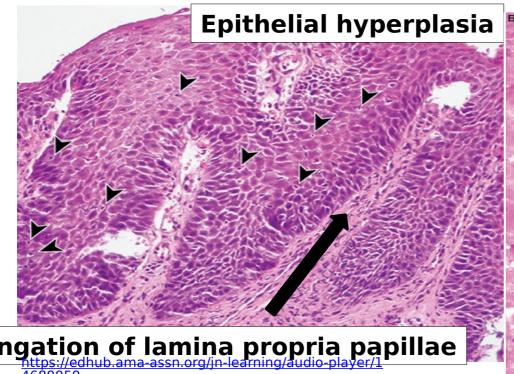
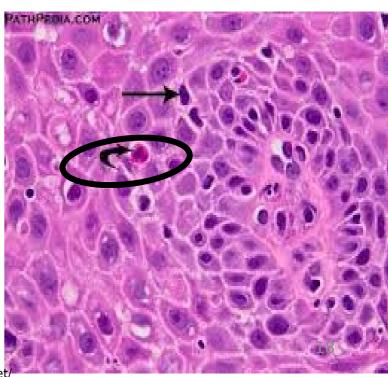
:Mic

Epithelial hyperplasia -1
Elongation of lamina propria papillae -2
Intra-epithelial neutrophils & eosinophils -3

https://edhub.ama-assn.org/jn-learning/audio-player/1 4680959

https://d3i71xaburhd42.cloudfront.net/

Reflux esophagitis

Gastroesophageal Reflux Disease(GERD)

Complications:

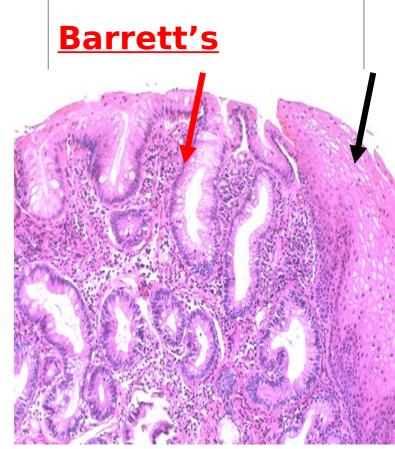
1- Peptic Ulcer

2- Bleeding

3- Fibrous stricture

4-Barrett's esophagus

Fibrous stricture

https://www.researchgate.net/publication/324407024/figure/fig4/AS:613918665867275@1523381024687/Distal-esophageal-stricture-seen-on-barium-swallow-study-on-day-17-Note-The-arrows.png

Barrett's

https://www.google.com.eg/url?sa=i&url=http%3A%2F%2Fpathologyapps.com%2Fhistology.php%3Fid%3D342&psig=AOvVaw1UDtqjpr9tP2yOJnyAordu&ust=1595368125102000&source=images&cd=vfe&ved=0CAIQjRxqFwoTCLCOqcjn3OoCFQAAAAAdAAAAABAP

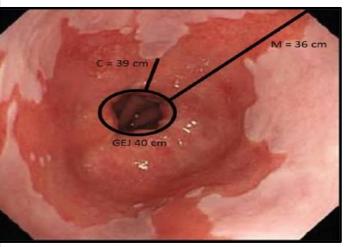
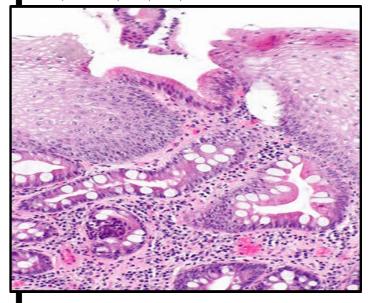
Def:

Replacement of esophageal mucosa by metaplastic intestinal columnar epithelium

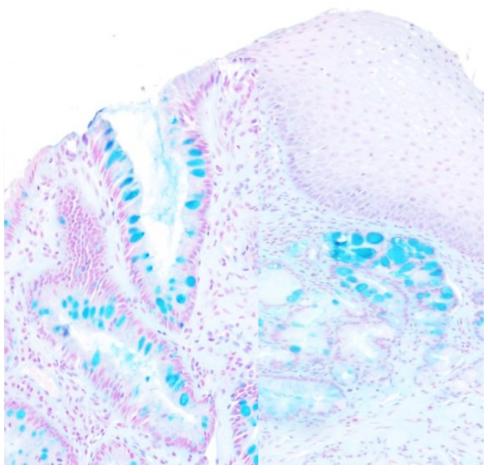
Endoscopy:

- Diagnosed by endoscopy & biopsy
- > 3cm above the gastro-esophageal junction
- Appears as **salmon-pink patches** between the smooth pale-pink esophageal squamous mucosa

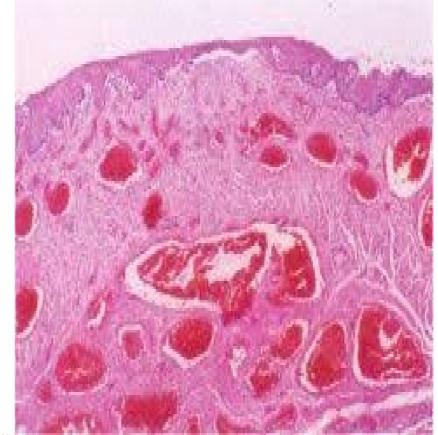
Mic : Replacement of esophageal mucosa stratified squamous epithelium by metaplastic intestinal columnar epithelium

Complication:

http://www.annalsgastro.gr/index.php/annalsgastro/article/download/2878/1879/16818

ttps://librepathology.org/w/images/thumb/6/6d/Esophagus_with_intestinal_metaplasia_--_intermed_mag.jpg/300px-

Barrett’s esophagus

https://www.pathpedia.com/education/eatlas/histopathology/esophagus/barretts_metaplasia/barrett%E2%80%99s-esophagus-(metaplasia)-[2-es006-2].jpeg?Width=600&Height=450&Format=4

https://www.newcomersupply.com/media/gallery/4023-ab-barretts-20x-p1.jpg

Esophageal varices

Definition: It is dilatation, and tortousity of the submucosal veins, present at the lower end of esophgus.

Non-neoplastic diseases of esophagus *(Quiz)*

<u>Put a suitable medical term for each of the following:</u>

1. Replacement of esophageal mucosa by metaplastic intestinal columnar epithelium

2. Saccular out-pouching of the esophageal wall.

3. Functional obstruction of esophagus due to Failure of relaxation of lower esophageal sphincter

4. Epithelial hyperplasia & Intra-epithelial neutrophils & eosinophils due to Incomptent lower esophageal sphincter

Non-neoplastic diseases of esophagus *(Quiz)*

Put a suitable medical term for each of the following:

1. Replacement of esophageal mucosa by metaplastic intestinal columnar epithelium **Barrett's esophagus**

2. Saccular out-pouching of the esophageal wall **Esophageal Diverticula**

3. Functional obstruction of esophagus due to Failure of relaxation of lower esophageal sphincter **Achalasia**

4. Epithelial hyperplasia & Intra-epithelial neutrophils & eosinophils due to Incomptent lower esophageal sphincter

Non-neoplastic diseases of esophagus *(Quiz)*

1. Name the type of epithelium that the blue arrow points at
2. Name the type of epithelium that the black arrow points at
3. What is the diagnosis of this lesion ?

Blue arrow : **Startified squamous epithelium**

Black arrow :**Metaplastic intestinal epithelium**

Diagnosis :**Barrett's esophagus**

Esophageal Tumours

Benign

Epithelial

E.g. Squamous .cell papilloma

Mesenchymal

eg. Leiomyoma

Malignant

Epithelial

- Squamous cell ,Carcinoma
- Adenocarcinoma

Mesenchymal

,eg. leiomyosarcoma

Esophageal Carcinoma

1- **Constitutional**: Old age and male gender

2- Diet: ↑ Hot spicy food & drinks

3- Habits: ↑ Alcohol & smoking.

4- Medical disorders of esophagus:

- Long-standing esophagitis
- Achalasia
- Barrett's esophagus(for adenocarcinoma)
- Plummer Vinson Syndrome
  - Esophageal webs
  - Microcytic hypochromic anemia

https://st4.depositphotos.com/11088892/23246/v/1600/depositphotos_232469224-stock-illustration-cartoon-middle-aged-

https://pbs.twimg.com/media/DmrgNOpUcAAq7yb.jpg

Esophageal Carcinoma

Gross :

A- Fungating mass

B- Ulcerative type

C- Diffuse (Annular) type

http://alf3.urz.unibas.ch/pathopic/e/getpic-fra.cfm?id=002895

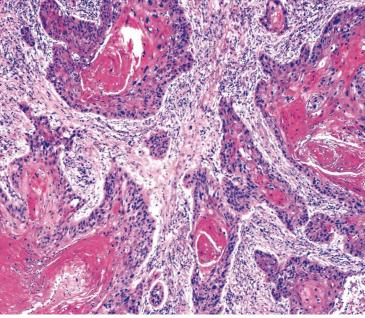
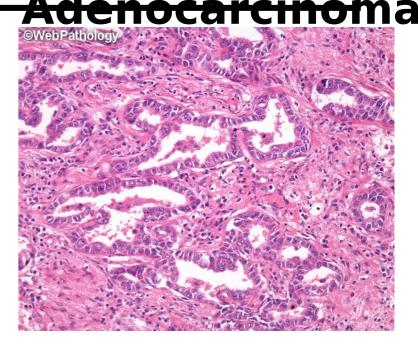
Esophageal Carcinoma

Mic:

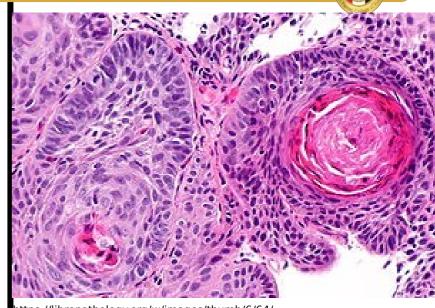
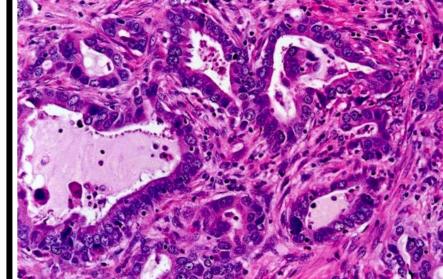
- **Squamous cell carcinoma**
- **Adenocarcinoma** : on top of Barrett's esophagus (Lower third)

Squamous cell carcinoma

Adenocarcinoma

https://www.google.com.eg/url?sa=i&url=https%3A%2F%2Fwww.researchgate.net%2Ffigure%2FSquamous-cell-carcinoma-well-differentiated-shows-keratocysts-Hematoxylin-and-eosin_fig3_262780424&psig=AOvVaw0oaMghJOFpAhzdDmtELpmq&ust=1595369142851000&source=images&cd=vfe&ved=0CAIQjRxqFwoTCJi82Lbr3OoCFQAAAAAdAAAAABAO

http://www.pathologyoutlines.com/wick/esophagus%20squamous%20carcinoma%20keratinizing%20type%20micro.jpg

https://www.webpathology.com/slides-13/slides/Lung_AdenoCA_Acinar7.jpg

Esophageal Carcinoma

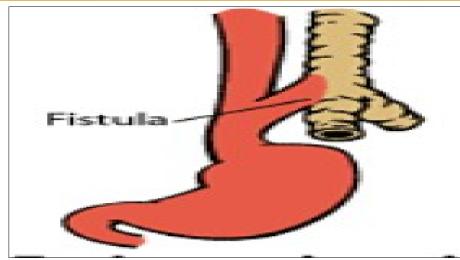
- **Squamous cell carcinoma:**
  Masses of epithelial cells with ample
  eosinophilic cytoplasm & and criteria of
  malignancy (what are they ???)
  Keratin pearls (cell nests)
- **Adenocarcinoma** :
  on top of Barrett's esophagus (Lower third)
  Glands variable in size and shape showing
  criteria of malignancy ??

https://librepathology.org/w/images/thumb/6/64/Esophageal_squamous_cell_carcinoma_-_a1_--_high_mag.jpg/300px-Esophageal_squamous_cell_carcinoma_-_a1_--_high_mag.jpg

https://www.pathologyoutlines.com/imgau/lungtumoradenocarcinomaLonardomic

Esophageal Carcinoma

2- Hematemesis.
3- Tracheo-esophageal fistula

4. Spread:

- **Direct:**
  Trachea & mediastinum.
- **Lymphatic**:
  Right supra clavicular lymph nodes
  regional nodes to cervical or

  mediastinal
- **Blood:** Late to lung liver, bone ….

http://d1yboe6750e2cu.cloudfront.net/i/26cee92a639f8fd3c3a2a1fe892c7e738dfeb6f8

https://www.researchgate.net/publication/266682552/figure/fig1/AS:214225957777431@1428086856295/Swelling-in-the-right-supraclavicular-area.png

Esophageal Tumours (*Quiz)*

Adenocarcinoma of esophagus most likely occurs on top of :

a. Esophageal varices
b. Achalasia
c. Barrett's esophagus
d. Benign Tumours

Esophageal Tumours Lecture (*Quiz)*

Adenocarcinoma of esophagus most likely occurs on top of :

a. Esophageal varices
b. Achalasia
c. Barrett’s esophagus
d. Benign Tumours

Key points

- Non-neoplastic diseases of esophagus : Achalasia ,Diverticula, Reflux esophagitis ,Barrett's esophagus.

- Barrett's esophagus occurs on top of reflux esophagitis

- Tumours of esophagus :most important squamous cell carcinoma and adenocarcinoma

- Adenocarcinoma (on top of Barrett's esophagus)

Suggested Textbooks

Kumar V, Abbas A, Aster J : In Robbins and Cotran pathologic basis of disease, 10th edition. Elsevier Saunders. Chapter 16